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A Taxonomic Revision of the Genus *Eutettix* in America North of Mexico (Homoptera, Cicadellidae)*

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ABSTRACT: This paper is a systematic study of the species which have been placed in the genus *Eutettix* since its erection by E. P. Van Duzee in 1892. A key to the species is included, as well as illustrations of male genitalia and last ventral segment of the female. Thirty-three species and subspecies are discussed, of which 21 are new. The following 12 species are retained: *Eutettix querci* Gillette & Baker, *E. tristis* Ball, *E. pictus* Van Duzee, *E. slossoni* Van Duzee, *E. subaeneus* (Van Duzee), *E. glennanus* Ball, *E. rubianus* (Ball), *E. nitens* Van Duzee, *E. bartschi* Van Duzee, *E. luridus* (Van Duzee), *E. southwicki* Van Duzee and *E. marmoratus* Van Duzee. The following new species and sub-species are named and described: *Eutettix aequalis*, *E. aequalis eberneus*, *E. apicalis*, *E. borealis*, *E. discolor*, *E. flavus*, *E. fulvovs*, *E. grandis*, *E. hibernus*, *E. latus*, *E. minutus*, *E. nitens pellucidus*, *E. parvus*, *E. pediculus*, *E. planus*, *E. prinoides*, *E. querci albus*, *E. rugosus*, *E. subspinosis*, *E. variabilis* and *E. acutus*.

INDEX

	PAGE		PAGE
acuminata	256	coronatus	256
acutus	259	discolor	288
aequalis	265	eberneus	267
albidus	256	exitiosus	256
albus	270	flavus	291
amanda	256	fulvovs	284
animata	256	glennanus	278
apicalis	268	gonianus	256
aurata	256	grandis	261
bartschi	283	hibernus	285
bicolorata	256	incertus	256
borealis	286	insanus	256
brunneus	290	johnsoni	256
chenopodii	256	latus	264
cineta	256	luridus	287
clarivida	256	magnus	274
columbianus	256	manitou	256

* A contribution of the Entomology Department of the University of Kansas, Lawrence, Kansas.

	PAGE		PAGE
marmoratus	290	rubianus	276
mildredae	256	rubida	256
minutus	284	rugosus	262
modesta	256	saucia	256
munda	256	seminuda	256
nevada	256	seabra	256
nitens	279	scitula	256
oculea	256	slossoni	275
osborni	256	snowi	256
palliatus	256	southwicksi	289
pannosus	256	subspinus	263
parvus	282	stactogalus	256
pauperculus	256	strictus	256
pediculus	273	strobi	256
pellucidus	280	subaeneus	277
perelegantis	256	tendellus	256
pietus	274	terebrans	256
planus	260	texana	256
primoides	272	tristis	271
pulehellus	256	vanduzeei	256
pullatus	256	variabilis	269
querei	269	ziezae	256

INTRODUCTION

THE genus *Eutettix* was proposed by E. P. Van Duzee (Psyche, vi, Aug., 1892, p. 307), naming *Thamnotettix lurida* as the orthotype. A taxonomic revision of the genus was published by E. D. Ball (Proceedings of the Davenport Academy of Sciences, Vol. 12, pp. 27-94, 1907) and the genus was divided into three subgenera—*Eutettix*, *Aligia* and *Mesamia*. In that paper all the species that have been retained in the genus *Eutettix* were considered as varieties of *subaeneus*, although Doctor Ball recognized *luridus* as the genotype. These varieties were as follows: *pictus* Van Duzee, *tristis* Ball, *slossoni* Van Duzee, *marmoratus* Van Duzee, *southwicksi* Van Duzee, *luridus* (Van Duzee), *subaeneus* (Van Duzee) and *querei* Gillette and Baker. Nineteen other species were placed in this subgenus, but these have since been referred to other genera and will be considered later.

Eutettix nitens and *E. bartschi* were described by Van Duzee in 1909 (Bull. of Buffalo Soc. of Nat. Hist., vol. ix, p. 223, 1909). *E. glennanus* was described by Dr. E. D. Ball in 1931 (Fla. Ent., vol. xv, p. 2, 1931) and *E. (Ollarianus) rubianus* was described by Doctor Ball in 1936 (Jour. Wash. Acad. Sci., vol. xxvi, p. 432, 1936).

Apparently all members of this genus feed on various species of oaks, although very little is known about the life histories of the species. Most of the species are found in the southern half of the United States, with Florida and Arizona being especially well represented by species of this genus.

CHARACTERS USED IN CLASSIFICATION

The internal male genital structures proved to be of greatest value in separating the species. The shape and size of the pygofer hook was of primary importance with the pygofer and aedeagus being important in some cases. The last ventral segment of the female was also found useful in separating certain species.

The most important external characters were shape and size of vertex, transparency of tegmen, color pattern and size of species. In this paper the vertex refers to that part of the head anterior to the pronotum and between the eyes; the frons, joining the vertex at its apex, and extending anteriorly to the suture separating it from the smaller, more anterior sclerite (anteclypeus). The vertex, as used here, is sometimes called the crown; the frons is often considered the clypeus; and the anterior sclerite, the clypellus.

The length of specimens refers to the distance from apex of vertex to apex of tegmen. The width of the pygofer is the distance across it at the point of attachment of the pygofer hook; the length of the pygofer is the distance from this point to the apex. The dorsal fork of a bifid pygofer hook is the one arising dorsally and usually extending further posteriorly than the other, or ventral fork.

SYNOPSIS OF GENUS

The genus *Eutettix* resembles *Aligia* but with second cross vein absent and usually with less cross veins throughout tegmina.

Clypeus about twice as long as width at narrowest point, broadest near distal end, both ends convexly rounded; frons gradually broadening from apex to base, sometimes slightly constricted near antennae; margins of lorae circular. Vertex usually about twice as wide as length at middle with the anterior margin typically rounded or slightly pointed, transverse furrow usually present; pronotum about twice as long as vertex at middle and about half as long as wide; scutellum triangular, about as long at middle as pronotum. Tegmina with few extra cross veins and with the second cross vein absent.

Typical color pattern if present as follows: Loral suture darkened, with a dark spot on each lateral margin; frons with about seven pairs of oblique markings; vertex with four pairs of dots, one just inside each ocellus, a pair near apex and two just inside each eye along posterior margin; transverse furrow darkened. Anterior half of pronotum usually lighter, with four pairs of dark spots along anterior margin sometimes present; scutellum with a large spot just inside each basal angle, a pair of smaller spots between these, and

transverse furrow, darker. Tegmen with clavus and adjacent area of corium usually more opaque than remainder of corium.

Genitalia: Pygofer triangular or oval; pygofer hook prominent, single or bifurcate. Plates slender, pointed; aedeagus with apical or lateral processes.

SYNONYMY

The following species, originally considered in *Eutettix*, have since been placed in the genus *Norvellina*:

<i>clarivida</i> (Van Duzee)	<i>columbiana</i> (Ball)	<i>rubida</i> (Ball)
<i>scminuda</i> (Say)	<i>suovi</i> (Ball)	<i>texana</i> (Ball)
<i>scitula</i> (Ball)	<i>saucia</i> (Ball)	<i>bicolorata</i> (Ball)
<i>pullata</i> (Ball)	<i>nevadae</i> (Ball)	<i>cheuopodii</i> (Osborn)
<i>perelegantis</i> (Ball)	<i>pulchella</i> (Baker)	<i>scabra</i> (Osborn & Ball)
<i>mildredae</i> (Ball)	<i>pauuosa</i> (Ball)	

The species listed below described as *Eutettix* or later placed therein are now as follows:

<i>Baudara johnsoni</i> (VanDuzee)	<i>Ollarianus strictus</i> (Ball)
<i>Baudara animana</i> (Ball)	<i>Phlepsius albidus</i> (Ball)
<i>Baudara aurata</i> (Ball)	<i>Phlepsius strobi</i> (Fitch)
<i>Aligia oculca</i> (Ball)	<i>Phlepsius ziezac</i> (Crumb)
<i>Aligia munda</i> (Ball)	<i>Colladonus amandus</i> (Ball)
<i>Aligia modesta</i> (Osborn & Ball)	<i>Colladonus incertus</i> (Gillette & Baker)
<i>Aligia manitou</i> (Ball)	<i>Exitianus exitiosus</i> (Uhler)
<i>Menosoma acuminata</i> (Baker)	<i>Athysanella tercbraus</i> (Gillette & Baker)
<i>Menosoma cincta</i> (Osborn & Ball)	<i>Macrosteles vanduzeei</i> (Gillette & Baker)
<i>Platymctopius palliolatus</i> (Ball)	

The following three species were found to be synonyms: *Eutettix osborni* Ball of *Opsius stactogalus* Fieber; *E. magnus* Osborn of *E. pictus* Van Duzee; and *E. brunneus* Osborn of *E. marmoratus* Van Duzee.

The following species do not belong to the genus *Eutettix*, but until their generic affinities are better understood, they are retained in this genus for convenience.

<i>tenellus</i> (Baker)	<i>pauperculus</i> (Ball)
<i>goniana</i> Ball	<i>coronatus</i> Ball
<i>iusanus</i> Ball	

KEY TO THE SPECIES OF EUTETTIX

1. Tegmen semihyaline white to fulvous, without a light spot near apex of clavus; color about the same throughout..... 2

Tegmen dark, or if light, with at least a semblance of a light spot near apex of clavus (except *rubianus*, which is characterized by 2 to 4 distinct black markings along margin of vertex); color pattern usually evident..... 13
- (1) Vertex flat, pointed, decidedly longer at middle than next eye; aedeagus with a pair of long, bifid, apical processes; pygofer hook relatively small..... 3

Vertex not so flat, apex rounded, only slightly longer at middle than next eye; aedeagus without a pair of long bifid apical processes; pygofer hook larger..... 4

3. (2) Vertex decidedly less than twice as long at middle than next eye; male more than $5\frac{1}{2}$ mm. in length, female more than 6 mm. in length; pygofer hook extending almost to apex of pygofer.....(4) *acutus* n. sp.
Vertex almost twice as long at middle as next eye; male less than 6 mm. in length; pygofer hook extending only to middle of pygofer and with a fleshy lobe near base.....(2) *planus* n. sp.
4. (2) Pronotum with longitudinal stripes evident; both forks of pygofer hook much longer than pygofer, ventral fork longest.....(3) *grandis* n. sp.
Pronotum without longitudinal stripes; forks of pygofer hook scarcely longer than pygofer, ventral fork never distinctly longer than dorsal..... 5
5. (4) Males $4\frac{3}{4}$ mm. or less in length; females 5 mm. or less in length; forks of pygofer hook about equal in length, ventral fork falcate, curved anteriorly; aedeagus short, not extending as far as apex of styles....(1) *rugosus* n. sp.
Males over $4\frac{3}{4}$ mm. in length, females over 5 mm. in length; forks of pygofer hook usually unequal in length, but if equal, anterior fork not curved anteriorly; aedeagus longer, extending at least as far as apex of styles.... 6
6. (5) Aedeagus with distinct lateral processes near middle and a pair of short processes near apex; forks of pygofer hook long and slender; last ventral segment of female truncate, only slightly, if at all, excavated on sides of the median notch.....(5) *subspinosis* n. sp.
Aedeagus without lateral processes near middle; at least one fork of pygofer hook broad; last ventral segment of female distinctly excavated on sides of median lobe or notch..... 7
7. (6) Apical processes on aedeagus less than $\frac{1}{4}$ length of shaft of aedeagus..... 8
Apical processes on aedeagus over $\frac{1}{4}$ length of shaft of aedeagus..... 10
8. (7) Aedeagus short; ventral fork of pygofer hook with lobe on ventral margin near middle, dorsal fork broadest near base.....(6) *latus* n. sp.
Aedeagus longer; ventral fork of pygofer hook only slightly wider near middle, dorsal fork almost parallel-margined on basal two-thirds..... 9
9. (8) Abdomen with black or fuscous markings; bright yellow to fulvous in color; not southern Arizona.....(7) *aequalis* n. sp.
Abdomen without black or fuscous markings; ivory-white to light yellow in color; southern Arizona.....*aequalis cibernicus* n. sub sp.
10. (7) Ventral fork of pygofer hook slightly falcate, curved posteriorly; Arizona.
(8) *apicalis* n. sp.
Ventral fork of pygofer hook straight, or if curved, pointed anteriorly; east of Arizona..... 11
11. (10) Males less than 5 mm. in length, females less than $5\frac{1}{2}$ mm. in length; ventral fork of pygofer hook much narrower than dorsal fork; New Mex., western Texas and southeastern Colorado..... 12
Males over 5 mm. in length, females over $5\frac{1}{2}$ mm. in length; ventral fork of pygofer hook about as wide as dorsal; eastern U. S.....(9) *variabilis* n. sp.
12. (11) Tegmen semihyaline fulvous; dorsal fork of pygofer hook about as broad at apical fourth as at base; ventral fork extending almost to margin of pygofer.....(10) *querci* Gillette and Baker
Tegmen semihyaline white to ivory; dorsal fork of pygofer hook distinctly narrower at apical fourth than at base; ventral fork usually extending only about half the distance to margin of pygofer....*querci albus* n. sub sp.
13. (1) Pronotum usually with distinct dark band near posterior margin..... 14
Pronotum without distinct dark band near posterior margin..... 18
14. (13) Tegmen semihyaline fulvous in both male and female, sometimes slightly clouded along margin of clavus.....(11) *tristis* Ball
Tegmen of both male and female not semihyaline fulvous, either opaque or "spotted" with opaque spots..... 15
15. (14) Vertex slightly pointed, male and female the same color; lorae and cheeks usually without darker markings; Southwest.....(12) *prinoides* n. sp.
Vertex parallel-margined; males usually darker than females; lorae and cheeks often with darker markings, especially in the male; eastern and middle western..... 16

16. (15) Vertex and scutellum usually orange; male $5\frac{1}{2}$ mm. or more in length, female 7 mm. or more in length; ventral fork of pygofer hook greatly widened on outer half(13) *pediculus* n. sp.
 Vertex and scutellum white to yellow; male less than $5\frac{1}{2}$ mm. in length, female less than 7 mm. in length; ventral fork of pygofer hook not greatly thickened on outer half..... 17
17. (16) Lorae and cheeks usually infuscated; dorsal fork of pygofer hook curved abruptly near base.....(14) *pictus* Van Duzee
 Only lorae usually infuscated, dorsal fork of pygofer hook not curved abruptly near base.....(15) *slossoni* Van Duzee
18. (13) Tegmen opaque white with two to four dark spots along anterior margin of vertex(16) *rubianus* (Ball)
 Tegmen not opaque white, or if so, without two to four dark spots along anterior margin of vertex..... 19
19. (18) Pronotum distinctly lighter than tegmen, with markings, if present, indistinct; face yellow with markings, if present, light fulvous..... 20
 Pronotum not distinctly lighter than tegmen, or if so, with markings darker and more pronounced; face not yellow with light fulvous markings..... 25
20. (19) General color of tegmen reddish-brown; aedeagus with two pairs of apical processes—one pair directed forward, the other directed backward; Colorado westward 21
 General color of tegmen not reddish-brown; aedeagus without two pairs of apical processes; Florida 22
21. (20) Male more than 6 mm. in length, female more than 7 mm. in length; vertex obtusely pointed; ventral fork of pygofer hook longer than dorsal; California(17) *subaeneus* (Van Duzee)
 Male less than 6 mm. in length, female less than 7 mm. in length; vertex rounded; ventral fork of pygofer hook shorter than dorsal; not California.
 (18) *glennanus* Ball.
22. (20) Male more than 5 mm. in length, female more than 6 mm. in length; basal two-fifths of ventral fork of pygofer hook much narrower than apical half, 23
 Male less than 5 mm. in length, female less than 6 mm. in length; basal two-fifths of ventral fork of pygofer hook not much narrower than apical half, 24
23. (22) Tegmen of male opaque fuscous excepting costal cell; tegmen of female opaque yellow excepting costal cell, with claval suture and anterior margin of clavus brown.....(19) *nitens* Van Duzee
 Tegmen of male and female translucent brown except for transparent costal cell*nitens pellucidus* n. sub sp.
24. (22) Vertex, pronotum and scutellum clear yellow with no evidence of typical markings except one large faint spot in each basal angle of scut lum; dorsal fork of pygofer hook not curved near base; only one pair of lateral processes near apex of aedeagus.....(20) *flavus* n. sp.
 Vertex, pronotum and scutellum ivory-yellow in female, slightly darker in male, with typical markings usually indicated; dorsal fork of pygofer hook curved near base; two pairs of processes near apex of aedeagus, although basal pair often very small.....(21) *parvus* n. sp.
25. (19) Frons of male black with typical markings light, darkest between antennae, frons of female yellow except for chocolate-brown band along base; pygofer hook less than half as long as distance from constriction to apex of pygofer(22) *bartschi* Van Duzee
 Frons of male and female not as above, or if frons of male as above, pygofer hook longer than half distance from constriction to apex of pygofer..... 26
26. (25) Males 4.2 mm. or less in length; females 5 mm. or less in length..... 27
 Males more than 4.2 mm. in length; females more than 5 mm. in length.... 28
27. (26) Processes at apex of aedeagus narrow, less than half as long as shaft of almost straight aedeagus; pygofer hook broadest near middle, split near apex; Tex and Okla.....(23) *minutus* n. sp.
 Processes at apex of aedeagus broader, more than half as long as shaft of curved aedeagus; pygofer hook broadest near outer fourth, not split near apex; southeast.....(24) *fulvovus* n. sp.

28. (26) Pygofer hook bifid..... 29
 Pygofer hook not bifid 32
29. (28) Ventral fork of pygofer hook greatly broadened on outer half..... 30
 Ventral fork of pygofer hook not much broader on outer half..... 31
30. (29) Male less than 6 mm. in length, females less than 7 mm. in length; south-east U. S.(25) *hibernus* n. sp.
 Male 6 mm. or more in length; female 7 mm. or more in length; northeast U. S.(26) *borealis* n. sp.
31. (29) Clavus and adjacent area of corium deep fulvous to opaque reddish-brown; dorsal fork of pygofer hook not curved abruptly near base; eastern U. S.(27) *luridus* (Van Duzee)
 Clavus and adjacent area of corium duller; dorsal fork of pygofer hook curved abruptly near base; western U. S.(28) *discolor* n. sp.
32. (28) Processes at apex of aedeagus over half as long as shaft of aedeagus.(29) *southwicksi* Van Duzee
 Processes at apex of aedeagus distinctly less than half as long as shaft of aedeagus(30) *marmoratus* Van Duzee

1. *Eutettix acutus* n. sp.

Similar to *querci*, but slightly larger, usually darker, with a flatter, longer vertex and with one fork of the pygofer hook greatly reduced. Length: Male, 5½ mm.; female, 6½ mm.

Vertex about one and two-thirds times as wide as length at middle, bluntly pointed, transverse furrow shallow; tegmen semihyaline, often darkening posteriorly.

Color: Frons, vertex and scutellum fulvous with typical markings usually absent but occasionally faintly indicated; pronotum slightly darker. Tegmen luteus semihyaline with veins concolorous or darkening posteriorly.

Male genitalia: Pygofer ovate, almost as wide at constriction as length from there to apex; pygofer hook curved dorsally, gradually narrowing to a sharp point, process arising on basal forth about one-fourth length of hook. Aedeagus long and straight, about five times as long as basal width, almost parallel margined throughout, a pair of bifid apical processes about one-third as long as shaft of aedeagus.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins somewhat constricted near middle, broad lobe on lateroposterior corner, posterior margin produced to a pair of lobes separated by a distinct median notch.

Types: Holotype male, allotype female and three pairs of paratypes, Chiricahua Mts., Ariz., July 14, 1938, R. H. Beamer. Paratypes from Arizona as follows: 1 male, Chiricahua Mts., June 9, 1933, 1 male, 1 female, Aug. 8, 1932, 2 males, 1 female, Aug. 10, 1941; 1 female, Chiricahua Nat'l Monument, Aug. 24, 1935; 1 male,

Huachuca Mts., Aug. 22, 1935, 1 male, Aug. 1, 1927, R. H. Beamer; 1 female, Chiricahua Mts., July 14, 1938, R. I. Sailer; 2 males, Chiricahua Mts., July 6, 1930, 1 female, July 27, 1935, 1 female, Sept. 12, 1931; 2 pairs, Faraway Ranch, July 26, 1935; 1 male, Huachuca Mts., July 29, 1935, 1 male, May 4, 1930, E. D. Ball; 1 male, Patagonia, June 24, 1933; 1 male, Carr Canyon, Huachuca Mts., Oct. 31, 1937, P. W. Oman; 1 female, Huachuca Mts., July 20, 1937, 1 female, Sept. 9, 1938; 1 female, Tumacacori Mts., July 21, 1940, D. J. & J. N. Knull. Types in the Kansas University collection and paratypes in this collection, the Ball collection, the Ohio State collection and the National Museum.

2. *Eutettix planus* n. sp.

Resembles *acutus*, but smaller, luteus in color and with one fork of the pygofer hook reduced to a fleshy lobe. Length: Male, 4.75 mm.; female, 5.75 mm.

Vertex about one and two-thirds times as wide as length at middle, bluntly pointed, transverse furrow indistinct; tegmen luteus semihyaline without vermiculations.

Color: Frons, vertex, pronotum and scutellum luteus with typical markings sometimes faintly indicated. Tegmen semihyaline luteus with veins concolorous.

Male genitalia: Pygofer broad, bluntly pointed, about four-fifths as wide at constriction as length from there to apex; pygofer hook with dorsal fork reduced to a fleshy lobe about half as long as ventral fork, which is straight and slightly over half as long as length of pygofer. Aedeagus in lateral view long, about six times as long as basal width, almost parallel-margined on outer three-fourths, a pair of apical, bifurcate processes, each fork over one-third as long as shaft of aedeagus.

Female genitalia: Last ventral segment almost twice as wide as length at middle, lateral margins slightly convex, posterior margin gradually produced to a slightly notched apex.

Types: Holotype male, allotype female and 9 male and 4 female paratypes, Miami, Arizona, July 22, 1932, J. D. Beamer. Paratypes from Arizona as follows: 2 males, 1 female, Miami, July 21, 1932, 6 males, 1 female, Aug. 6, 1941; 1 female, Prescott, July 29, 1933, 1 pair, Yarnell, July 27, 1933, R. H. Beamer; 1 female, Yarnell Hts., Aug. 20, 1929, 1 female, July 21, 1929; 3 males, Pinal Mts., July 18, 1935; 2 pairs, Superior, July 17, 1935; 1 pair, Glenn Oaks, July 19, 1929, 1 male, July 18, 1929, 1 pair, Oct. 7, 1929, E. D. Ball; 1 male,

Prescott N. F., July 14, 1940, D. J. & J. N. Knull. Paratypes from New Mexico: 1 male, Silver City, July 22, 1936, R. H. Beamer. Types in the University of Kansas collection and paratypes in this collection, Ohio State collection, Ball collection and National Museum.

This species and *acutus* approach *Twiningia* in the sharp, flat vertex but the genitalia resemble more nearly other species of *Eutettix*.

3. *Eutettix grandis* n. sp.

Resembles *querci*, but larger, darker and with the forks of the pygofer hook much longer. Length: Male, 6 mm.; female, 6 $\frac{1}{4}$ mm.

Vertex slightly over twice as wide as length at middle; almost parallel-margined, transverse furrow distinct; tegmen semihyaline with occasional clouded spots, especially in clavus.

Color: Frons and vertex ivory, with a line along transverse furrow and one or two dots inside each eye, fulvous; pronotum fulvous with anterior margin and three longitudinal markings, lighter; scutellum yellow-ivory with a large spot inside each basal angle, darker. Tegmen semihyaline luteus, darker in clavus, veins concolorous to light fulvous.

Male genitalia: Pygofer short, almost as wide at constriction as width from there to bluntly-pointed apex; pygofer hook bifid, dorsal fork slightly shorter, curved ventrally on outer fifth and posteriorly on outer tenth, widening gradually to outer sixth, short recurved spine on anterior margin near sharp apex; ventral fork widest on outer fourth, then narrowing to a sharp apex. Aedeagus in lateral view three times as long as basal width, widest at base, then narrowing to outer third, apex rounded, transparent membrane along dorsal margin extending from base to outer third; a pair of processes about one-half as long as basal width of aedeagus located on outer sixth and with a pair of lateral stylet-shaped processes arising near base, about four-fifths as long as shaft.

Female genitalia: Last ventral segment slightly less than twice as wide as length at middle, anterior margin almost straight, lateral margins almost straight, posterior margin slightly convex with a small lobe on each side of a small median notch.

Types: Holotype male, allotype female and 7 male and 3 female paratypes, Chiricahua Mts., Ariz., July 14, 1938, R. H. Beamer. Paratypes from Arizona as follows: 1 female, Chiricahua Mts., July 8, 1932; 1 female, Santa Rita Mts., June 12, 1933, 1 male, 2 female, July 17, 1932, R. H. Beamer; 1 female, Chiricahua Mts.,

July 14, 1938, L. W. Hepner; 1 male, Huachuca Mts., July 18, 1938, D. W. Craik; 1 pair, Santa Rita Mts., June, F. H. Snow; 2 male, 1 female, Tuscon, June 30, 1929, 2 male, 1 female, Sept. 29, 1929, 1 pair, June 9, 1929, 1 female, Sept. 1 1929, 1 pair, Oct. 20, 1929, 1 pair, Huachuca Mts., June 15, 1930; 1 female, Chiricahua Mts., July 28, 1935, E. D. Ball; 1 pair, Huachuca Mts., June 11, 1933, P. W. Oman; 1 male, 2 female, Chiricahua Mts., Sept. 14, 1938, 1 male, July 26, 1937; 1 pair Huachuca Mts., Sept. 9, 1938; 1 male, Patagonia, Aug. 20, 1940; 1 female, Tuscon, Aug. 16, 1940, D. J. & J. N. Knull. Types in the University of Kansas collection and paratypes in this collection and in the Ohio State collection, the Ball collection and in the National Museum.

This species differs from any other *Eutettix* in the long, slender forks of pygofer hook and the lateral processes arising from near the base of the aedeagus.

Eutettix rugosus n. sp.

Similar to *querci* but, smaller, with the ventral fork of the pygofer hook curved anteriorly and with the aedeagus thicker and shorter. Length: Male, $4\frac{1}{4}$ mm.; female, 5 mm.

Vertex slightly over twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen semihyaline fulvous, slightly clouded near appendix.

Color: Frons, vertex, pronotum and scutellum ivory to bright yellow, pronotum usually slightly darker and typical markings sometimes faintly indicated. Tegmen fulvous to luteus semihyaline with veins concolorous, if darker area present, restricted to appendix.

Male genitalia: Pygofer long-ovate, almost as wide at constriction as length from there to rounded apex; pygofer hook bifid, forks about equal in length, dorsal fork narrowest on outer third, broadest just beyond, apex curved posteriorly, prominent spines at outer fourth on ventral margin; ventral fork slightly falcate, broader than dorsal fork, curved anteriorly, notched along posterior margin. Aedeagus in lateral view barely twice as long as basal width, a pair of triangular lateral processes near apex and a pair of slender apical processes about as long as basal width of shaft of aedeagus; in ventral view, narrowest at base, a pair of triangular processes on outer fourth, apex rounded.

Female genitalia: Last ventral segment over twice as wide as length at middle, anterior margin almost straight, lateral margin

convex, posterior margin excavated on both sides of a prominent unnotched median lobe extending as far posteriorly as the lateral margins.

Types: Holotype male, allotype female and 6 male and 1 female paratypes, Miami, Arizona, July 22, 1932, J. D. Beamer. Paratypes from Arizona as follows: 10 males, 1 female, Miami, July 22, 1932, 1 male, 2 females, Yarnell, July 29, 1933, 1 male, July 25, 1932, 1 pair, July 27, 1933, 1 female, Yavapai Co., July 1, 1929, R. H. Beamer. Types and paratypes in the University of Kansas collection.

5. *Eutettix subspinosus* n. sp.

Resembling *querci*, but larger, brighter yellow, and with forks of pygofer hook much more slender. Length: Male, 5½ mm.; female, 6 mm.

Vertex slightly more than twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen semi-hyaline luteus with milky spots present, especially in the clavus.

Color: Frons, vertex and anterior portion of pronotum lemon yellow, pronotum darker along posterior margin; scutellum yellow to orange with typical markings faintly indicated. Tegmen luteus semi-hyaline with veins concolorous; sometimes faintly clouded with white in clavus and adjacent area of corium.

Male genitalia: Pygofer oval, almost as wide at constriction as length from there to apex; pygofer hook bifid, dorsal fork curved ventrally on basal fourth, widest at base, almost parallel-margined on outer three-fourths to sharp apex, ventral fork almost straight, widest near middle, apex sharp. Aedeagus in dorsal view bifid on outer fifth, about five times as long as basal width, a pair of erect lateral spines near middle and a pair of smaller, lateral, triangular processes near apex.

Female genitalia: Last ventral segment slightly less than twice as wide as length at middle, anterior margin almost straight, lateral margins irregularly convex, posterior margin strongly convex with small median notch.

Types: Holotype male, allotype female and 5 male and 6 female paratypes, Santa Rita Mts., Ariz., July 17, 1932, R. H. Beamer. Paratypes from Arizona as follows: 6 males, Santa Rita Mts., June 12, 1933; 2 males, 4 females, Ruby, July 22, 1938; 3 males, 4 females, Patagonia, June 24, 1933, 1 male, 2 females, Aug. 21, 1935; 1 pair, Baboquivari Mts., July 19, 1932, 3 pairs, Benson, Dec. 21, 1941, R. H. Beamer: 1 male, 4 females, Santa Rita Mts., July 17,

1932, J. D. Beamer; 1 male, Santa Rita Mts., July 19, 1938, R. I. Sailer; 1 male, Atascosa Mts., Sept. 29, 1935, 4 females, Aug. 16, 1935; 1 male, Tucson, Apr. 27, 1930, 1 female, Oct. 20, 1929, 1 female, June 16, 1929; 1 pair, Nogales, Aug. 16, 1937, E. D. Ball; 9 males, 2 females, Santa Rita Mts., June 16, 1933, 7 males, 4 females, June 27, 1933; 3 males, 2 females, Patagonia, June 24, 1933, 1 male, Sasabe, Oct. 17, 1937, P. W. Oman. Types in the University of Kansas collection; paratypes in this collection, E. D. Ball collection and the National Museum. The specimen collected by E. D. Ball at Tucson, Ariz., on April 27, 1930, was labeled "blue oak."

6. *Eutettix latus* n. sp.

Resembles *querci*, but slightly darker and with the forks of the pygofer hook greatly broadened and the aedeagus with shorter apical processes. Length: Male, $5\frac{1}{2}$ mm.; female, $6\frac{1}{2}$ mm.

Vertex slightly over twice as wide as length at middle, slightly pointed, transverse furrow shallow; tegmen fulvous semihyaline, sometimes slightly clouded in appendix and at base of claval veins.

Color: Frons, vertex, pronotum and scutellum yellow in male, ivory in female, markings sometimes lightly indicated, pronotum darkest. Tegmen fulvous semihyaline with numerous milky translucent spots, especially in the female, veins concolorous, rarely darkening posteriorly, sometimes clouded with fuscous at apex of claval veins and in appendix.

Male genitalia: Pygofer bluntly pointed, about three-fourths as wide at constriction as length from there to apex; pygofer hook bifid, both forks directed posteriorly, dorsal fork broadest near base, curved posteriorly just beyond middle, gradually narrowing to a sharp point, ventral fork falcate, smaller, broadest near middle, narrowing to a sharp point. Aedeagus in lateral view relatively short, about four times as long as greatest width, gradually narrowed to outer third, slightly broader at apex, a pair of apical processes about as long as narrowest width of aedeagus; in ventral view, parallel-margined to outer fifth, broadest at apex, bifurcate on outer fifth, and with apical processes about as long as width of aedeagus at apex.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex, posterior margin deeply excavated on either side of a distinct unnotched median lobe extending slightly further posteriorly than lateral margins.

Types: Holotype male, allotype female and 8 male, 5 female paratypes, Redding, California, June 28, 1935, E. I. Beamer. Paratypes from California as follows: 3 pairs, Redding, June 28, 1935; 1 female, Clayton, July 20, 1935; 1 male, 3 female, Dales, June 28, 1935; 12 male, 15 female, Santa Rosa, Aug. 16, 1938, R. H. Beamer; 3 male, 7 female, Santa Rosa, Aug. 16, 1938; 1 female, Arroyo Seco River, Aug. 8, 1938, L. W. Hepner; 3 male, 2 female, Santa Rosa, Aug. 16, 1938; 6 female, Arroyo Seco River, Aug. 8, 1939, R. I. Sailer; 1 male, Pasadena, July 12, 1931, 1 female, June 21, 1931; 2 female, June 19, 1931; 3 female, Pine Valley, July 6, 1931; 1 pair, Beaumont, June 12, 1931; 1 pair, Lebec, June 25, 1934, 2 male, Medford, Ore., Aug. 26, 1934, 2 pairs, Aug. 12, 1934, E. D. Ball; 8 male, 21 female, Redding, June 28, 1935; 4 male, 1 female, Three Rivers, June 9, 1935; 2 female, Winters, June 26, 1935, P. W. Oman; 1 female, Laguna Mts., July 27, 1940; 1 female, Pinon Flat, Santa Rosa Mts., July 1, 1941, D. J. & J. N. Knull. Types in the Kansas University collection. Paratypes in this collection, Ohio State collection, E. D. Ball collection and National Museum.

7. *Eutettix acqualis* n. sp.

Similar to *quercei*, but with ventral fork of pygofer hook larger and directed posteriorly; shorter processes at apex of aedeagus; distribution, Colorado to Arizona. Length: Male, 5 mm.; female, 6 mm.

Vertex about twice as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen semihyaline without vermiculations or extra cross veins.

Color: Frons, vertex, pronotum, scutellum and tegmen light yellow to fulvous, vertex and scutellum the same color as the pronotum and tegmen slightly darker; typical markings sometimes faintly indicated; apical cells may be very lightly clouded.

Male genitalia: Pygofer long-ovate, slightly over two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork curved ventrally just beyond middle and posteriorly near outer fifth, gradually broadening from base to outer fifth, apex pointed; ventral fork slightly falcate, widest near middle, apex directed posteriorly. Aedeagus in lateral view extending about as far as apex of styles, narrowest near middle with a pair of short apical processes about as long as greatest width of shaft of aedeagus.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex, posterior margin almost straight except for a distinct unnotched median lobe.

Types: Holotype male, allotype female, Glenwood Springs, Colo., Aug. 17, 1929, P. W. Oman. Paratypes: 1 male, Aug. 17, 1929, Glenwood Springs, Colo., L. D. Anderson. 1 female, Glenwood Springs, Colo., Aug. 16, 1936; 3 males, Sloss, Colo., Aug. 17, 1929; 2 males, Oak Creek Canyon, Ariz., Aug. 14, 1927, 1 male, July 31, 1933, 1 female, Aug. 9, 1932; 2 females, Ash Fork, Ariz., Aug. 8, 1932; 2 females, Yarnell, Ariz., July 27, 1933, 1 female, July 25, 1932; 2 females, Prescott, Ariz., July 29, 1933, 1 female, Aug. 7, 1932; 1 pair, Granite Dell, Ariz., July 30, 1933; 2 pairs, Pintura, Utah, Aug. 11, 1929; 5 females, Cedar City, Utah, Aug. 13, 1929; 1 female, Salt Lake City, Utah, July 3, 1931, R. H. Beamer. 1 female, Prescott, Ariz., Aug. 7, 1932, J. D. Beamer. 1 male, Cimarron, Colo., Aug. 22, 1896, 1 female, Trinidad, Colo., July 12, 1899, C. P. Gillette. 1 female, Pintura, Utah, Aug. 11, 1929; 2 males, 1 female, Granite Dell, Ariz., June 29, 1933; 9 males, 13 females, Yarnell Heights, Ariz., June 29, 1933, P. W. Oman. 3 males, Glenn Oaks, Ariz., July 19, 1929, 4 males, 5 females, Oct. 7, 1929, 2 males, 4 females, July 18, 1929; 7 males, 6 females, Granite Dell, Ariz., Oct. 6, 1929, 6 females July 17, 1929; 6 females, Yarnell Heights, Ariz., Oct. 8, 1929, 1 female, Oct. 4, 1929, 2 females, July 21, 1929; 1 female, Grand Canyon, Ariz., Aug. 1, 1930; 2 females, Patogonia, Ariz., July 20, 1930; 1 pair, Cedar, Utah, Sept. 12, 1915; 1 male, Durango, Colo., Aug. 13, 1933, E. D. Ball. 1 male, Richfield, Utah, Sept. 12, 1930, E. W. Davis. 1 male, 5 females, Salt Lake City, Utah, Aug. 27, 1906, 3 females, July 13, 1908, 1 male, 3 females, Aug. 29, 1908; 2 males, 1 female, Palmer Lake, Colo., Sept. 18, 1901; 1 male, Durango, Colo., Aug. 9, 1900; 3 males, Ashfork, Ariz., July 14, 1929; 8 females, Oak Creek Canyon, Ariz., Aug. 15, 1938, 1 male, Aug. 1, 1938, 2 females, July 13, 1940; 1 male, 5 females, Prescott, Ariz., June 8, 1941, 5 males, 1 female, June 2, 1937, 1 male, 15 females, July 14, 1940, 1 male, June 6, 1937, 1 pair, June 20, 1937, 1 female, Aug. 18, 1938, 2 males, 4 females, Lincoln Co., N. M., July 9, 1940, D. J. & J. N. Knull. 1 male, 2 females, Palmer Lake, Colo., 3 males, Granite, Utah, July 4, 1936, 1 male June 24, 1926, 3 males, 1 female, June 26, 1936, 1 male, July 14, 1936, 1 pair, June 15, 1936, 1 male, July 8, 1936, 1 pair, July 17, 1936, 1 female, July 21, 1935, 4 females, July 21, 1935, 2 females, July 15, 1936, 1 female, July 24, 1935, 2 females, July 25, 1935, W. M. Allen. 4 males, 1 female, Big Cottonwood Canyon, Utah, July 13, 1935; 2 females, Granite, Utah, Aug. 6, 1935; 2 males, 1 female, Herriman, Utah, Nov. 3, 1935; 1 male, Santaquin, Utah,

Sept. 15, 1935; 1 male, Salt Lake City, Utah, July 13, 1935; 1 male, Tropic, Utah, Sept. 19, 1935, 1 male, Parley Canyon, Utah, Sept. 6, 1932, G. F. Knowlton. 2 males, Big Cottonwood Canyon, Utah, Aug. 27, 1935, C. J. Sorenson. 1 male, Ogden, Utah, Sept. 20, 1935, R. C. Roskelley. 1 male, Oak Creek Canyon, Utah, July 16, 1936, L. Jeppsen. Types are in the Kansas University collection and paratypes are in this collection and the Colorado State, Utah State, Ohio State and E. D. Ball collections and the National Museum.

This species replaces *querci* west of the continental divide and east of California. There is some variation in the shape of the pygofer hooks of the specimens from Colorado, Utah, and Arizona, but all are undoubtedly the same species. Gillette and Baker's *querci* types from Glenwood Springs, Colorado, were probably this species, but all of them apparently have been lost.

Eutettix aequalis eberneus n. sub sp.

Similar to *aequalis*, but slightly smaller, much lighter in color, aedeagus slightly shorter and with the dorsal fork of the pygofer hook almost straight. Length: Male, $4\frac{3}{4}$ mm.; female, $5\frac{1}{2}$ mm.

Vertex about twice as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen ivory white to light fulvous semihyaline without clouded areas.

Color: Frons, vertex, scutellum and pronotum ivory white to light fulvous, brightest in males; markings on scutellum sometimes faintly indicated. Tegmen semihyaline light fulvous with veins concolorous, occasionally slightly darkened in appendix and adjacent apical cell. Abdomen without darker markings.

Male genitalia: Pygofer long, about three-fifths as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork almost parallel-margined to outer fifth, apex pointed; ventral fork falcate, broadest near middle, apex pointed. Aedeagus in lateral view short, about four times as long as greatest width, narrowest just beyond middle and broadest near base and apex, a pair of apical processes about as long as average width of aedeagus; in ventral view bifurcate on outer fifth, almost twice as wide at apex as at base, gradually broadening from base to apex, processes hidden.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, posterior margin excavated on both sides of a prominent unnotched median lobe.

Types: Holotype male, allotype female and 4 male and 10 female

paratypes, Tombstone, Ariz., July 16, 1936, E. D. Ball. Additional paratypes as follows: 6 male, 1 female, Tombstone, Ariz., June 9, 1936, E. D. Ball, all in the E. D. Ball collection at the National Museum.

This species may be separated externally from *querci albus* by the absence of any darker markings on the abdomen.

8. *Eutettix apicalis* n. sp.

Resembles *querci*, but slightly smaller and luteus in color; ventral fork of pygofer hook curved anteriorly. Length: Male, 5 mm.; female, 5.25 mm.

Vertex about twice as wide as length at middle, almost parallel-margined to slightly pointed, transverse furrow usually distinct; tegmen luteus semihyaline except for occasionally a lightly clouded area in appendix.

Color: Frons, vertex, pronotum and scutellum bright yellow to luteus with typical markings sometimes lightly indicated. Tegmen semihyaline luteus to fulvous with veins concolorous, sometimes apices slightly clouded.

Male genitalia: Pygofer long, about two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork slightly longer, widest on outer fourth, curved ventrally just beyond middle, and posteriorly on outer fifth; ventral fork falcate, almost parallel-margined near middle, then tapering to a sharp apex. Aedeagus in lateral view reaching as far as apex of style, about four times as long as greatest width, widest at base, and almost parallel-margined on outer third; a pair of apical processes about one-third length of aedeagus.

Female genitalia: Last ventral segment about twice as wide as length at middle, posterior margin almost straight, lateral margins slightly convex, rounded on lateroposterior corner, posterior margin excavated on both sides of a prominent unnotched median lobe extending further posteriorly than the lateral margins.

Types: Holotype male, allotype female and 7 pairs of paratypes, Chiricahua Mts., Ariz., July 14, 1938, R. H. Beamer. Paratypes from Arizona as follows: 2 male, 2 female, Chiricahua Mts., July 8, 1932, 7 male, 1 female, Aug. 7, 1941, 1 female, June 9, 1933, 2 female, Aug. 7, 1941; 1 female, Chiricahua Nat'l Monument, Aug. 24, 1935; 1 male, Sunnyside Canyon, Huachuca Mts., July 9, 1940, R. H. Beamer; 1 male, 1 female, July 14, 1938, R. I. Sailer; 1 female, Chiricahua Nat'l Monument, Aug. 24, 1935, Jean Russell; 4 male, 4 female, Chiricahua Mts., July 6, 1930; 3 male, 1 female, Faraway

Ranch, July 26, 1935, E. D. Ball; 2 male, 1 female, Chiricahua Mts., June 15, 1939, 1 male, Sept. 14, 1938, 1 female, July 26, 1937, D. J. & J. N. Knull. Types in the Kansas University collection and paratypes in this collection and the Ohio State and E. D. Ball collections.

9. *Eutettix variabilis* n. sp.

Resembling *querci*, but luteus, darker in the male; pygofer more sharply pointed and dorsal fork strongly curved just beyond middle. Length: Male, 5½ mm.; female, 6½ mm.

Vertex about twice as wide as length at middle, almost parallel margined, transverse furrow usually distinct; tegmen semihyaline luteus.

Color: Frons, vertex, pronotum, and scutellum light yellow to luteus in female, much brighter in the males, typical markings sometimes present. Tegmen of female light luteus; of male, dark luteus, veins concolorous.

Male genitalia: Pygofer long, two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork curved ventrally just beyond middle and curved posteriorly near apex, ventral fork barely reaching to margin of pygofer, straight or slightly curved anteriorly. Aedeagus long, about six times as long as greatest width, widest near base, but almost parallel-margined throughout its length, a pair of apical processes about one-third length of shaft; in ventral view, parallel-margined, bifid on outer sixth.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly produced near middle, posterior margin excavated on both sides of a notched or unnotched median lobe.

Types: Holotype male, allotype female and 3 male and 1 female, Fayetteville, Arkansas, 1938, M. W. Sanderson; Paratypes as follows: 32 male, 6 female, Washington Co., Ark., June 30, 1940, M. W. Sanderson. Types and paratypes in the Kansas University collection.

10. *Eutettix querci* Gillette & Baker

Eutettix querci, Gillette & Baker, Hemiptera of Colorado, p. 101, 1895.

Resembling *apicalis*, but fulvous in color and with the ventral fork of the pygofer hook straight and reduced. Length: Male, 4¾ mm.; female, 5½ mm.

Vertex about twice as wide as length at middle, transverse furrow distinct; tegmen fulvous semihyaline with veins darkening posteriorly in the male and almost opaque in the female.

Color: Frons, vertex, pronotum and scutellum yellow-green in the male, fulvous in the female, typical markings sometimes indicated; tegmen semihyaline fulvous in the male with veins darkening posteriorly, more opaque in the female and with a slightly greenish color.

Male genitalia: Pygofer long-ovate, about three-fourths as wide at constriction as length from there to rounded apex; pygofer hook bifid, dorsal fork about twice as long as ventral, almost parallel-margined to outer fourth, curved ventrally on outer fourth and posteriorly on outer fifth, prominent teeth along ventral margin; ventral fork slender and straight to a pointed apex. Aedeagus in lateral view about six times as long as greatest width, almost parallel-margined throughout; a pair of apical processes about one-third length of shaft; in ventral view parallel-margined and bifid on outer sixth.

Female genitalia: Last ventral segment about twice as wide as length at middle, posterior margin almost straight, lateral margins somewhat convex, posterior margin excavated on both sides of a prominent, unnotched median lobe.

Types: Lectotype female, Manitou, Colorado, Sept. 29, 1894, C. P. Gillette, (swept from *Quercus undulata*) in the Colorado State collection. This species was described from one male and nine females collected at Manitou, Colorado and Glenwood Springs, Colorado. The specimens collected at Glenwood Springs were evidently *aequalis*, since *querci* does not extend that far west. The only specimen of this series that I was able to locate was the one female co-type in the Colorado State collection, which I here designate lectotype. In case the other co-types are lost, I designate as a neotype a male specimen collected at Trinidad, Colorado, July 13, 1890, in the Colorado State collection. Specimens of this species were examined from Santa Rosa, N. Mex., Cimarron, N. Mex., Clouderoft, N. Mex., Colfax Co., N. Mex., Davis Mts., Tex., Montezuma Co., Colorado and Durango, Colorado.

Eutettix querci albus n. sub sp.

Similar to *querci*, but white to ivory in color and with the ventral fork of the pygofer hook somewhat more reduced. Length: Male, 4.75 mm.; female, 5.25 mm.

Vertex about twice as wide as length at middle, slightly more pointed than *querci*, transverse furrow distinct; tegmen hyaline to opaque white to ivory.

Color: Frons, vertex, pronotum and scutellum yellow to greenish-

yellow in the male, white to ivory in the female, typical markings on the scutellum sometimes present. Tegmen white to ivory, semihyaline in the male, more opaque in the female with veins usually darkened posteriorly, especially in the male.

Male genitalia: Pygofer long, about two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork over twice as long as ventral, almost parallel margined to outer fifth, where it curves abruptly posteriorly; ventral fork straight, narrow and sharply pointed. Aedeagus in lateral view about six times as long as basal width, almost parallel-margined for the entire length of the shaft, a pair of apical processes about one-third length of shaft; in ventral view, parallel-margined and slightly bifid at apex.

Female genitalia: Last ventral segment about twice as wide as length at middle, posterior margin almost straight, lateral margins faintly sinuate, rounded on lateroposterior corner, posterior margin excavated on both sides of a prominent unnotched median lobe extending further posteriorly than the lateral margins.

Types: Holotype male, allotype female and 8 male and 17 female paratypes, Kenna, N. Mex., Aug. 9, 1941, R. H. Beamer. Additional paratypes as follows: 2 pairs, Kenna, N. Mex., Aug. 9, 1941, B. Hodgden, 2 pairs, July 16, 1936, D. R. Lindsay; 6 males, 7 females, Shamrock, Tex., Aug. 10, 1941, R. H. Beamer, 2 pairs, Aug. 10, 1941, E. L. Todd. Types in the Kansas University collection.

This species is separated from *aequalis eberneus* by a more easterly distribution, presence of fuscous markings on the abdomen and longer apical processes on the aedeagus. It differs from *querci* by being lighter in color and with a shorter ventral fork on the pygofer hook. The specimens collected by R. H. Beamer Aug. 9, 1941, at Shamrock, Tex., were collected on *Querci prinoides*.

11. *Eutettix tristis* Ball

Eutettix subaenea var *tristis*, Ball, Proc. Dav. Acad. Sci., xii, p. 34.

Similar to *pictus*, but lighter in color, without the dark markings on cheeks and with dorsal fork of pygofer hook extending as far as ventral. Length: Male, 5½ mm.; female, 6½ mm.

Vertex over twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen semihyaline fulvous throughout.

Color: Frons yellow with two large basal spots, black, oblique markings sometimes faintly indicated, vertex yellow with two large dark spots along anterior margin, usually separated by a narrow

yellow line, pronotum yellow except for wide fulvous to fuscous band usually covering most of posterior half, lighter in female; scutellum yellow to fulvous with typical markings sometimes present. Tegmen semihyaline fulvous with white spots at apex of clavus at least indicated, usually darkened on both sides of this spot, veins usually concolorous but may darken posteriorly, apical cells sometimes slightly infuscated.

Male genitalia: Pygofer slightly over one-half as wide at constriction as length from there to pointed apex, pygofer hook bifid, dorsal fork "goosenecked" near base, widest near middle, apex pointed, ventral fork widest near base, extending about as far as dorsal, pointed at apex. Aedeagus in lateral view slightly over three times as long as greatest width, almost parallel-margined to outer third, narrowing to a bluntly pointed apex, a pair of short processes on dorsal margin near apex.

Female genitalia: Last ventral segment slightly less than twice as wide as length at middle, almost straight along anterior and lateral margins, posterior margin almost straight except for large unnotched median lobe.

Type: A specimen of this species in the National Museum bears Ball's name label and is designated as lectotype. It is a female labeled "Jacksonville, Fla." and has a small "TYPE" on the pin. In the original description no specimen is named as a type.

Material examined: Specimens are on hand from Florida, Louisiana, South Carolina, Georgia, Maine, Illinois and Kansas so that one might say that this species may be found in most of the eastern part of the United States.

Occasionally specimens of this species may have the band on the pronotum very light or indistinct, but the large pair of dark markings at apex of vertex readily separates this species from *marmoratus*, which it resembles in having semihyaline fulvous tegmen.

12. *Eutettix prinoides* n. sp.

Resembles *slossoni*, but with vertex slightly pointed, with males and females the same color, with forks of pygofer hook longer and more slender; more western in distribution. Length: Male, 5 mm.; female, 6 mm.

Vertex about twice as wide as length at middle, obtusely pointed, transverse furrow shallow; tegmen semihyaline, approaching opaqueness in clavus and spots in corium.

Color: Face yellow with two black spots at base extending from ocelli to center, separated by a narrow yellow line; vertex yellow

except for two large black spots along anterior margin; pronotum gray to yellow except for broad brown band near posterior margin and a small brown dot at middle of anterior margin; scutellum ivory white to yellow with typical markings sometimes faintly indicated. Tegmen semihyaline to opaque fulvous in the clavus and adjacent area of corium, a large white spot near apex of clavus; margin of clavus, a spot in discal cell and in each antepical cell and sometimes apical cells, infuscated. In some specimens the white in the tegmen is replaced by yellow.

Male genitalia: Pygofer about one half as wide at constriction as length from there to bluntly pointed apex; pygofer hook bifid, forks about equal in length, dorsal fork "goosenecked" near base, slightly broadest on outer half to pointed apex, ventral fork slightly broader than dorsal. Aedeagus in lateral view about five times as long as greatest width, broadest near middle, narrowing to a rounded apex, a pair of short processes on dorsal margin on outer fifth; in ventral view, bifid on outer two-fifths and a pair of short lateral processes on outer third.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex, posterior margin excavated on each side of a distinct unnotched median lobe extending slightly further posteriorly than lateral margins.

Types: Holotype male, allotype female and 16 male and 13 female paratypes, Shamrock, Texas, Aug. 10, 1941, R. H. Beamer. Paratypes as follows: 9 male, 3 female, Shamrock, Tex., Aug. 10, 1941, E. L. Todd; 2 male, 1 female, Kenna, N. Mex., July 16, 1936, D. R. Lindsay; 1 male, 2 female, Kenna, N. Mex., July 16, 1936; 1 male, 2 female, Sutton Co., Tex., July 16, 1928; 1 female, Ozona, Tex., July 9, 1936; 1 female, Kendall Co., Tex., July 22, 1928; 1 female, Concan, Tex., July 6, 1936; 1 female, San Antonio, Tex., July 4, 1936, R. H. Beamer; 3 male, 14 female, Concan, Tex., June 4, 1933, P. W. Oman. Types in the University of Kansas collection and paratypes in this collection and in the National Museum.

This species was collected at Shamrock, Tex., on *Quercus prinoides* by R. H. Beamer.

13. *Eutettix pediculus* n. sp.

Resembles *pictus*, but larger, approaching orange in color except on tegmen and with the ventral fork of the pygofer hook much narrower on basal half than on apical half. Length: Male, 5.75 mm.; female, 7 mm.

Vertex about twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen varying from opaque along margin of clavus to transparent along costal margin.

Color: Frons, vertex, pronotum and scutellum yellow to orange, except for following fuscous markings: A spot on disc of frons; two large spots enclosing both ocelli, covering anterior half of vertex and basal portion of frons, separated mesally by a narrow light line; broad band across posterior half of pronotum. Markings on scutellum sometimes lightly indicated. Cheeks and lorae may or may not be darkened. Clavus and adjacent area of corium and apical cells opaque black, costal cell transparent.

Male genitalia: Pygofer about two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork curved abruptly near base, almost parallel-margined to pointed apex; ventral fork narrowest on basal third, much broader near middle, pointed at apex. Aedeagus in lateral view about six times as long as greatest width, almost parallel-margined on basal three-fifths, gradually narrowing to a rounder apex, a pair of short processes on dorsal margin near apex.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior and lateral margins almost straight, lateral margins slightly converging posteriorly, posterior margin almost straight except for distinct unnotched median lobe.

Types: Holotype male, allotype female and 1 male and 2 female paratypes, Clarksville, Tenn., July 22, 1915, 1 male, Woodville, Miss., July 25, 1921, C. J. Drake; 1 male, Coffeyville, Kansas, July 4, 1939, 1 female, July 25, 1939, L. W. Hepner; 1 female, Elk City, Kansas, July 3, 1926, Beamer & Lawson; 1 male, Hilliard, Fla., Aug. 31, 1930, R. H. Beamer; 1 male, Caddo Parish, La., Aug. 19, 1928, Jack Beamer; 1 pair, Thebes, Ill., July 11, 1935, LeLong & Ross; 1 male, Elizabethtown, Ill., July 8, 1935, Ross & DeLong; 1 male, Rosiclare, Ill., July 5, 1935, Frison & Mohr.

This species resembles *pictus* externally, but the genitalia resembles more nearly that of *nitens*.

14. *Eutettix pictus* Van Duzee

Eutettix pictus, Van Duzee, Trans. Am. Ent. Soc., xix, p. 301, 1892.

Eutettix magnus, Osborn, Ent. News, xi, p. 395, 1900.

Resembles *slossoni*, but larger, darker, with the cheeks beyond lorae usually infuscated and with the dorsal fork "goosenecked" near base. Length: Male, 5 mm.; female, 6½ mm.

Vertex slightly over twice as wide as length at middle, almost

parallel-margined, transverse furrow indistinct; tegmen varying from semihyaline along costal margin to opaque in clavus.

Color: Frons of female yellow with the base dark, of male, yellow with base dark and markings on disc, fuscous to black; lorae and adjacent area of cheeks usually infuscated; vertex, pronotum and scutellum yellow to orange, darkest in the male with apical half of pronotum and a broad band on posterior half of pronotum, brown to black. Tegmen with white opaque spot near apex of clavus; clavus and adjacent half of corium brown to fuscous, darkest along margin of clavus and in discal cell; remainder of wing fulvous semihyaline except for infuscated apical cells.

Male genitalia: Pygofer slightly over half as wide at constriction as length from there to pointed apex; pygofer hook bifid with ventral fork pointed, broader than dorsal and extending slightly farther than dorsal, widest on outer third, dorsal fork "goosenecked" near base, gradually broadening to outer third, apex pointed. Aedeagus in lateral view slightly over four times as long as greatest width, largest near middle, narrowing to a bluntly pointed apex, a pair of short processes on dorsal margin near apex.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior and lateral margins almost straight, posterior margin shallowly excavated on each side of a prominent un-notched median lobe.

Types: Holotype female, Pennsylvania, C. W. Johnson, in the Iowa State collection, Ames, Iowa. The allotype male of *magnus*, Morgan Co., Ill., June 29, 1892, F. M. McElfresh, in the Ohio State collection, Columbus, Ohio.

Specimens are on hand from most of the eastern half of the United States from Florida to Texas on the south and from Wisconsin to Pennsylvania on the north. The specimens from the southern part of this area are smaller than those from points farther north. As a rule, both the male and female have the checks somewhat infuscated, but occasionally an entire series is found in which this marking is absent in the female. The "goosenecked" basal portion of the dorsal fork of the pygofer hook readily separates this species from *slossoni*, while its color is much darker than *tristis*.

15. *Eutettix slossoni* Van Duzee

Eutettix slossoni, Van Duzee, Bull. Soc. Nat. Sci., v. p. 210, 1894.

Similar to *tristis*, but smaller, more darkly colored and with the dorsal fork of the pygofer hook without the gooseneck near base. Length: Male, 4 mm.; female, 5 mm.

Vertex about twice as wide as length at middle, almost parallel-margined, transverse furrow almost absent; tegmen varying from semihyaline in females to opaque in males.

Color: Frons of female yellow with two large apical spots, fuscous; of male, black with typical markings yellow; vertex, pronotum and scutellum yellow with two large spots on anterior margin of vertex and band across posterior part of pronotum, brown to black. Tegmen of female semihyaline light fulvous with veins darkening posteriorly and darkened along outer margin of elavus, in apical cells, and in center of discal cell; males opaque black in clavus and adjacent area of corium, outer half of corium partly semihyaline and partly opaque, both sexes have distinct white spot at apex of clavus.

Male genitalia: Pygofer slightly over one-half as wide at constriction as length from there to sharp apex, pygofer hook bifid with forks about equal in width, but with ventral fork usually slightly longest and with no gooseneck near base of dorsal fork. Aedeagus in lateral view slightly over three times as long as greatest width, slightly widest near middle, narrowing to a bluntly pointed apex, a pair of short processes on dorsal margin near apex; in ventral view, bifid on outer half.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior and lateral margins almost straight, posterior margin excavated on each side of a prominent, unnotched median lobe, which extends slightly further posteriorly than the rounded lateroposterior corner.

Types: Holotype female, Charlotte Harbor, Florida, Annie Trumbull Slosson in the Iowa State collection, Ames, Iowa; allotype male, labeled "Florida" here designated, in the Iowa State collection.

Material examined from Florida: Hilliard, Suawnee Springs, Lachooche, Tampa, Hiberia, La Belle, Cedar Keys, Zolpho Springs, Hudson and Duval Co.

16. *Eutettix rubianus* (Ball)

Ollarianus rubianus, Ball, E. D., Jour. Wash. Acad. Sci., v. xxvi, p. 432, 1936.

Resembling *subaeneus*, but shorter, tegmen opaque ivory-grey, black spots along anterior margin of vertex and with dorsal fork of pygofer hook bifid at apex. Length: Male, 5½ mm.; female, 6 mm.

Vertex about three times as wide as length at middle, almost parallel-margined, transverse furrow distinct, tegmen opaque with veins darker.

Color: Frons light yellow with typical markings fulvous; vertex

ivory-yellow with one or two marks inside each eye, fulvous, a spot just above each ocellus and a pair of lines near apex, black; pronotum ivory-grey, lightest along anterior margin with four pairs of spots sometimes evident; scutellum ivory-yellow with typical markings yellow to light fulvous except for a black dot along each lateral margin. Tegmen opaque ivory-grey with veins brown.

Male genitalia: Pygofer long, slightly over one-half as wide at constriction as length from there to pointed apex, pygofer hook bifid, dorsal fork curved and parallel-margined on basal two-thirds, split at apex with two sharp points, ventral fork straight, about as long as dorsal, broadest near outer third, a small process on dorsal margin near middle, apex pointed. Aedeagus in lateral view about five times as long as greatest width, slightly narrowed from base to apex, a pair of narrow erect apical processes about one-fourth length of shaft of aedeagus and a pair of broader processes about one-half length of shaft, directed anteriorly.

Female genitalia: Anterior margin of last ventral segment almost straight, lateral margins somewhat convex, posterior margin rounded marginally, slightly excavated on each side of a distinct, unnotched median lobe.

Types: Holotype female, Atascosa Mt., Ariz., Nov. 3, 1935, E. D. Ball, in the National Museum, Washington, D. C.

Material studied: Specimens studied from Atascosa Mt., Ariz., in April and May, 1936.

17. *Eutettix subaeneus* (Van Duzee)

Thamnotettix subaeneus, Van Duzee, Ent. Am., vi, p. 77, 1890.

Resembles *luridus*, but much longer, narrower and aedeagus with two pairs of apical processes; Pacific coast species. Length, 6 mm., 7 mm.

Vertex about twice as wide as length at middle, bluntly pointed, transverse furrow distinct; tegmen fulvous semihyaline with occasional clouded areas.

Color: Frons, vertex, pronotum and scutellum ivory-yellow with typical markings usually lightly indicated. Tegmen semihyaline fulvous with veins darkening posteriorly, somewhat clouded at ends of claval veins, in discal cell, middle antepical cell and in apical cells.

Male genitalia: Pygofer slightly over half as wide at constriction as length from there to bluntly pointed apex; pygofer hook bifid, ventral fork longest, curved posteriorly, narrowing gradually to a sharp apex, dorsal fork curved ventrally on basal third, parallel-

margined on basal half, then narrowing gradually to a sharp point. Aedeagus in lateral view about six times as long as basal width, gradually narrowing to a bluntly pointed apex with two pairs of apical processes, one erect pair, one-fourth length of shaft, projecting anteriorly and the other pair, one-third length of shaft, largest near middle, projecting posteriorly.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins, slightly convex and converging, posterior margin almost straight except for a distinct unnotched median lobe.

Types: Lectotype male, allotype female, Cal., Coquillet, in the Iowa State collection, Ames, Iowa.

Material on hand from California is as follows: Alpine, Lompoc, Miramar, San Antonio Canyon, San Diego, Stinson Beach, Santa Cruz Mts., Irvine Park, Jamesburg, Monterey, Los Angeles and Taylorville. There is also one male specimen from Pendleton, Oregon.

This species and *latus* are the only ones in the genus found in California. *E. subaeneus* is easily separated from *latus* by the darker color of the tegmen and the pointed vertex.

18. *Eutettix glennanus* Ball

Eutettix glennanus, Ball, E. D., Fla. Int., xv. p. 2, 1931.

Resembles *subaeneus*, but smaller, with the vertex rounded and sometimes with two to four black spots along margin of vertex present, forks of pygofer hook almost equal in length. Length: Male, 5 mm.; female, 6½ mm.

Vertex almost three times as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen semihyaline fulvous irregularly clouded with opaque fulvous markings.

Color: Frons light fulvous with typical markings absent or slightly darker; vertex light fulvous with two spots just inside each eye and line along transverse furrow, slightly darker, a spot just above each ocellus and a pair near apex, fuscous or fulvous; pronotum greyish-fulvous, lightest along anterior margin where four pairs of fulvous spots are sometimes present; scutellum ivory to light fulvous with two black dots along lateral margins usually present, other typical markings sometimes dark fulvous. Tegmen semihyaline light fulvous, with some clouded areas present, veins dark fulvous, commissural spot present.

Male genitalia: Pygofer ovate, about three-fourths as wide at constriction as length from there to broadly pointed apex; pygofer

hook bifid, both forks about the same width and extending just beyond margin of pygofer, dorsal fork curved ventrally near basal fourth, almost parallel-margined to sharp apex, ventral fork straight or slightly curved anteriorly. Aedeagus in lateral view slender, about six times as long as greatest width, gradually narrowing from base to apex, two pairs of slender apical processes, one pair, about one-third length of shaft, directed anteriorly and the other, about one-half length of shaft, directed posteriorly.

Female genitalia: Last ventral segment slightly less than twice as wide as length at middle, anterior margin almost straight, lateral margins rounded evenly to convex posterior margin, distinct un-notched median lobe.

Types: Holotype female, allotype male and 1 female paratype, Glenn Oaks, Ariz., Oct. 7, 1929, E. D. Ball.

Material examined: (Arizona) Huachuca Mts., Patagonia. Tucson, Santa Rita Mts., Hualpai Mt., Pinaleno Mt., (Colorado) Fort Collins, Poudre River Canyon, Montezuma Co. (Utah) St. George, (Texas) Davis Mts.

Specimens of this species from Colorado are larger and have been confused with *subaeneus* and *luridus*. The type material, collected in the fall, has the dark markings along the anterior margin of the vertex. However, specimens collected in the summer usually lack these markings.

19. *Eutettix nitens* Van Duzee

Eutettix nitens, Van Duzee, Bull. Buff. Soc. Nat. Hist., ix, 223, 1909.

Resembles *luridus*, but with tegmen of male opaque black and clavus of female opaque fulvous to yellow; ventral fork of pygofer hook with slender basal pedicel. Length: Male, 5½ mm.; female, 6 mm.

Vertex over twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen varying from fulvous semihyaline in corium of female to opaque black in male.

Color: Frons, vertex, pronotum and scutellum ivory to bright yellow without color markings. Tegmen of female fulvous semihyaline in corium, becoming opaque in clavus, opaque yellow spot near apex of clavus, brown along anterior margin of clavus, along claval suture, on apical cells and often spots in corium; of male, opaque brown to black, becoming semihyaline along costal margin.

Male genitalia: pygofer long, slightly over one-half as wide at constriction as length from there to pointed apex; pygofer hook bifid, ventral fork slightly longest, very narrow on basal two-fifths, widest

slightly beyond middle, gradually narrowing to a sharp point, dorsal fork curved near base, widest on outer third, pointed. Aedeagus in lateral view about four times as long as greatest width, largest near middle, narrowing to a bluntly pointed apex, a pair of very short processes on dorsal margin on outer fifth.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins convex, slightly converging; posterior margin slightly convex on both sides of an unnotched median lobe.

Types: I was unable to locate the types of this species, but co-types of *bartschi*, described at the same time, are in the California Academy Science Museum so the types of this species may also be there. The species was described from various localities in Florida.

Material studied: (Florida) Sanford, St. Augustine, Hobe Sound, Cold, Hudson, Palm Beach, Branford, La Belle, Cedar Keyes and Inverness.

Eutettix nitens pellucidus n. sub sp.

Similar to *nitens*, but smaller and with tegmen semihyaline fulvous. Length: Male, 5 mm.; female, 5½ mm.

Vertex almost three times as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen semihyaline, approaching translucency in clavus.

Color: Frons, vertex, pronotum and scutellum fulvous-yellow, markings on scutellum sometimes faintly indicated. Tegmen translucent fulvous in clavus and adjacent area of corium; remainder of tegmen semihyaline fulvous, darkest along outer margin of clavus except for distinct yellow commissural spot near apex of clavus.

Male genitalia: Pygofer about three-fifths as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork slightly shortest, curved ventrally near base, gradually narrowing to pointed apex; ventral fork narrowed on basal two-fifths, broadest near middle, narrowing gradually to a sharp apex. Aedeagus in lateral view about five times as long as greatest width, broadest near middle, narrowing to a bluntly pointed apex, a pair of short processes on dorsal margin at outer fifth, in ventral view, bifid on outer third.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex, posterior margin almost straight on each side of a distinct unnotched median lobe.

Types: Holotype male, allotype female and 1 pair of paratypes,

Ocala, Florida, Aug. 13, 1926, E. D. Ball. Additional paratypes from Florida as follows: 1 female, Ocala, Aug. 14, 1926, 3 males, 2 females, Nov. 6, 1927; 1 pair, Apopka, Aug. 14, 1926; 1 pair, Jacksonville, May 8, 1927; 1 pair Sanford, July 3, 1926, 1 female, Sept. 2, 1926, 1 male, 2 females, May 30, 1926, 1 pair, Apr. 30, 1926, E. D. Ball; 1 male, Coconut Grove, Aug. 9, 1930, L. D. Tutbill.

20. *Eutettix flavus* n. sp.

Resembles *nitens*, but smaller with tegmen fulvous to golden in both male and female; ventral fork of pygofer hook not greatly compressed near base. Length: Male, 4½ mm.; female, 5¼ mm.

Vertex slightly over twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen semihyaline to translucent, becoming almost transparent along costal margin.

Color: Frons, vertex, pronotum and scutellum yellow to fulvous with markings, if present, faintly indicated. Tegmen fulvous, varying from translucent in the clavus to almost transparent along the costal margin, veins in apical third of wing distinct; commissural spot present near apex of clavus.

Male genitalia: Pygofer about two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifurcate, both forks straight and about equal in length and width. Aedeagus in lateral view about five times as long as greatest width, broadest near middle, narrowing to a rounded apex, a pair of short, erect processes on dorsal margin near apex, on ventral margin bifid on outer third.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex, posterior margin excavated on both sides of a median unnotched lobe that extends about as far posteriorly as the latero-posterior corners.

Types: Holotype male, allotype female and 2 male and 3 female paratypes, Likely, Florida, July 24, 1934, R. H. Beamer. Additional paratypes from Florida as follows: 1 male, Lake Jovita, July 20, 1934, R. H. Beamer; 1 male, Sanford, Aug. 22, 1933, C. O. Bare; 6 male, 4 female, Sanford, July 22, 1926, 1 female, May 28, 1926, 4 female, June 22, 1926, 2 female, Oct. 7, 1926, 1 female, July 3, 1926, 1 male, 2 female, Oct. 24, 1926, 1 female, Apr. 28, 1926, 3 male, Nov. 3, 1925, 1 male, Jan. 15, 1926, 1 female, Feb. 15, 1926, 4 pairs, Aug. 4, 1926, 3 female, July 1, 1926, 2 female, June 16, 1926, 2 male, 3 female, July 4, 1926, 2 female, Aug. 17, 1926, 2 female, Sept. 27, 1926, 1 female, May 19, 1926, 1 male, 2 female, Sept. 9, 1926, 1

female, Jan. 21, 1926, 1 male, May 28, 1926, E. D. Ball; 4 male, 8 female, Sanford, July 22, 1939, P. W. Oman. Types in the Kansas University collection; paratypes in this collection, the E. D. Ball collection and National Museum.

This species was listed by Doctor Ball as *E. bartschi*, but it differs from that species in the coloration of the frons as well as in the genital characters.

21. *Eutettix parvus* n. sp.

Resembles *nitens*, but smaller, lighter in color with typical markings usually evident, and without ventral fork of pygofer hook greatly narrowed at base. Length: Male, 4½ mm.; female, 5½ mm.

Vertex slightly over twice as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen semihyaline fulvous.

Color: Frons, vertex, and scutellum ivory white to yellow, brightest in male, markings usually evident; pronotum darker than vertex in male, concolorous in female. Tegmen semihyaline fulvous in male, translucent fulvous in female, veins sometimes darkening posteriorly; margin of clavus darkened, except for commissural spot near apex.

Male genitalia: Pygofer long-ovate, about two-thirds as wide at constriction as length from there to rounded apex; pygofer hook bifid, both forks about equal in length, dorsal fork curved abruptly near base, almost parallel-margined to pointed apex, ventral fork parallel-margined on basal half, widest on outer fourth, pointed. Aedeagus in lateral view about four times as long as greatest width, slightly broadest near middle, narrowing to a rounded apex; in ventral view, bifid on outer third.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex and converging, posterior margin excavated on both sides of an unnotched median lobe extending slightly further posteriorly than lateroposterior corner.

Types: Holotype male, allotype female and 2 female paratypes, Suwanee Springs, Florida, July 29, 1930, R. H. Beamer. Additional paratypes from Florida as follows: 1 female, Wakulla Springs, July 14, 1934, R. H. Beamer; 1 female, Suwanee Springs, July 29, 1930, 1 male, Old Town, July 11, 1939, P. W. Oman. Types and paratypes in the Kansas University collection.

This species is closely related to *flavus*, from which it may be sep-

arated by its slightly larger size, markings on vertex and frons usually present and the longer, more slender forks of the pygofer hook.

22. *Eutettix bartschi* Van Duzee

Eutettix bartschi, Van Duzee, Bull. Buff. Soc. Nat. Sci., ix, 223, 1909.

Resembling *luridus*, but smaller, with frons of female unmarked except for basal band, with long processes at apex of aedeagus and with pygofer hook small and single. Length: Male, 4.2 mm.; female, 5 mm.

Vertex about twice as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen semihyaline with some light and clouded areas.

Color: Frons of male dark fuscous, almost black, with about six diagonal arcs on each side, yellow; female, yellow with only base fulvous to fuscous and arcs sometimes faintly indicated; vertex and scutellum ivory to yellow with typical markings fulvous, usually darker in the male; pronotum darker than vertex, lightest along anterior margin. Tegmen semihyaline fulvous, darkest in male, veins distinct only in light areas, commissural spot distinct.

Male genitalia: Pygofer long-ovate, about three-fourths as wide at constriction as length from there to apex; pygofer hook short, slightly longer than one-half width of pygofer at constriction, sinuately narrowed to a sharp point. Aedeagus in lateral view about five times as long as basal width, almost parallel-margined throughout its length, a pair of erect, apical processes about one-half length of shaft of aedeagus.

Female genitalia: Last ventral segment about twice as wide as length at middle, almost straight along anterior margin, lateral margins slightly convex, posterior margin straight, except for distinct unnotched median lobe.

Types: Lectotype male, allotype female, in the Ohio State University collection, Columbus, Ohio.

Material studied: (Florida) Fort Myers, Homestead, Orange Co., St. Petersburg, Sanford, St. Augustine, Hudson, La Belle, Hobe Sound, Likely, Cocoanut Grove, Tampa, Sebring, Elfers. Old Town and West Palm Beach.

The female of this species can be separated easily from any other species in the genus by the peculiar coloration of the frons. However, occasionally a specimen will be found in which the band extends over most of the frons.

23. *Eutettix minutus* n. sp.

Resembling *bartschi*, but smaller in size, with slightly longer vertex, with frons yellow and with typical markings only faintly indicated. Length: Male, 4 mm.; female, 5 mm.

Vertex slightly less than twice as wide as length at middle, bluntly pointed, transverse furrow distinct; tegmen semihyaline with small clouded areas sometimes present in the clavus.

Color: Frons ivory-yellow with markings faintly indicated in the male and absent in the female; vertex and scutellum ivory-yellow to light fulvous with typical markings distinct and slightly darker; pronotum fulvous to brownish-grey, lightest along anterior margin, much darker in the male than in the female. Tegmen semihyaline fulvous with veins darkening posteriorly, four spots along claval margin, and extreme apex, fuscous, commissural spot usually only lightly indicated.

Male genitalia: Pygofer ovate, about three-fourths as wide at constriction as length from there to rounded apex; pygofer hook reaching almost to apex of pygofer, broadest on outer third, notched on outer fifth, apex pointed. Aedeagus in lateral view almost five times as long as basal width, broadest near middle, a pair of apical processes broadest near apex, slightly less than one-half length of shaft of aedeagus.

Female genitalia: Last ventral segment about twice as wide as length at middle, almost straight along anterior margin, lateral margins convex and converging, posterior margin almost straight except for distinct notched median lobe.

Types: Holotype male, allotype female and 11 male and 1 female paratypes, Shamrock, Tex., Aug. 10, 1941, R. H. Beamer. Additional paratypes as follows: 3 male, Shamrock, Tex., Aug. 10, 1941, E. L. Todd; 1 female, Sutton Co., Tex., July 16, 1928; 1 male, Wichita National Forest, Okla., June 28, 1936, R. H. Beamer; 1 male, Concan, Tex., June 4, 1933, P. W. Oman. Types in the Kansas University collection and paratypes in this collection and the National Museum.

This species resembles *fulvovus*, but may be separated by its slightly more pointed vertex, more slender processes at apex of aedeagus, notch near apex of pygofer hook and distribution.

24. *Eutettix fulvovus* n. sp.

Resembles *southwicki*, but smaller, with a sharper vertex, tegmen darker and with the markings on vertex darker. Length: Male, 4.2 mm.; female, 5 mm.

Vertex about twice as wide as length at middle, obtusely pointed; transverse furrow distinct; tegmen semihyaline but usually with irregular clouded areas.

Color: Frons, vertex, pronotum and scutellum ivory-yellow to fulvous with typical markings usually distinct and slightly darker; tegmen fulvous semihyaline with fuscous clouded areas in discal cell, at end of claval veins and in apical cells; veins darkening posteriorly.

Male genitalia: Pygofer ovate, about three-fourths as wide at constriction as length from there to apex; pygofer hook reaching almost to apex of pygofer, gradually broadening to outer fifth, then narrowing suddenly to a sharp point. Aedeagus about five times as long as basal width, almost parallel-margined throughout its length, a pair of apical processes widest on outer third and slightly longer than one-half length of shaft of aedeagus.

Female genitalia: Last ventral segment slightly less than twice as wide as length at middle, almost straight along anterior margin, lateral margins slightly convex, posterior margin straight, except for notched median lobe.

Types: Holotype male, allotype female and one pair of paratypes, Laocoochee, Fla., Aug. 18, 1930, R. H. Beamer. Additional paratypes from Florida as follows: 1 male, Yankeetown, July 31, 1930; 1 male, Sanford, July 22, 1939, P. W. Oman; 1 male, Hudson, July 13, 1939, R. H. Beamer; 3 pairs, Sanford, Nov. 3, 1925, 1 male, Sept. 10, 1925, 3 male, June 2, 1926, 1 male, Sept. 2, 1926, 2 male, Oct. 24, 1926, 2 male, 5 female, June 18, 1926, 1 female, Feb. 14, 1926, 1 female, Sept. 7, 1925, 2 female, June 22, 1926, 2 female, July 3, 1926, 2 female, Sept. 9, 1925, 1 female, Sept. 4, 1926, E. D. Ball. Types in the Kansas University collection and paratypes in this collection, the E. D. Ball collection and National Museum.

25. *Eutettix hibernus* n. sp.

Similar to *nitens*, but with pronotum about same color as tegmen and with markings on vertex and frons distinct. Length: Male, 5 mm.; female, 6½ mm.

Vertex slightly over twice as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen varying from translucent in clavus to semihyaline along costal margin.

Color: Frons of male fulvous with typical markings ivory-white, frons of female ivory-yellow with markings fuscous except for chocolate-brown band covering basal third; vertex and scutellum ivory-white to fulvous with typical markings at least faintly indicated;

pronotum reddish-brown, darkest in male, with four pairs of dots along anterior margin distinct. Clavus and adjacent area of corium translucent to opaque dark brown to reddish-brown, outer half of corium light fulvous semihyaline.

Male genitalia: Pygofer about two-thirds as wide at constriction as length from there to apex; pygofer hook bifid, dorsal fork curved abruptly near base, slightly broadest on outer third, apex pointed, ventral fork much narrowest on basal two-fifths, broadest near middle, apex pointed. Aedeagus in lateral view about four times as long as greatest width, almost parallel-margined on basal three-fifths, narrowing to a rounded apex, a pair of short processes on dorsal margin near apex; in ventral view, bifid on outer two-fifths.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex and converging posteriorly, posterior margin almost straight except for unnotched median lobe.

Types: Holotype male, allotype female and 1 male paratype, Grison, Florida, Feb. 4, 1941, L. W. Hepner. Paratypes: 1 male, Seminole Co., Fla., Jan. 10, 1930, 1 male, Jan. 3, 1930, W. M. Loe; 1 male, St. John Co., Fla., Feb. 28, 1930, L. L. Knight; 1 female, Columbia Co., Fla., Jan. 27, 1930, R. B. Howard. Types in the Kansas University collection and paratypes in this collection and the National Museum.

At first it seemed that this might be a winter form of *nitens*, but typically colored *nitens* specimens have also been collected in the winter.

26. *Eutettix borealis* n. sp.

Resembles *nitens*, but larger, pronotum about same color as tegmen, markings on frons distinct and found in northeast United States. Length: Male, 6½ mm.; female, 7 mm.

Vertex almost two and one-half times as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen varying from translucent in clavus to semihyaline in costal cell.

Color: Frons fulvous with markings lighter, some dark markings in the male; vertex fulvous with typical markings brown to reddish-brown; pronotum brownish-yellow to reddish-brown, light markings along anterior margin distinct; scutellum fulvous with typical markings darker; tegmen reddish in the female, brownish-yellow in the male, varying from translucent in the clavus to semihyaline fulvous in the costal cell.

Male genitalia: Pygofer about two-thirds as wide at constriction

as length from there to pointed apex; pygofer hook bifid, dorsal fork slender, almost parallel-margined, curved abruptly near base, ventral fork much narrowed on basal two-fifths, broadest near middle, apex pointed. Aedeagus in lateral view about four times as long as greatest width, almost parallel-margined on basal half, then narrowing to a rounded apex, a pair of short processes on dorsal margin near apex.

Female genitalia: Last ventral segment about twice as wide as length at middle, posterior and lateral margins almost straight, lateral margins slightly converging posteriorly, posterior margins somewhat convex with a prominent unnotched median lobe.

Types: Holotype male, Durham, N. H., Sept. 21, 1922; allotype female, Woods Hole, Mass., July 4, 1925, E. D. Ball. 1 female paratype, Woods Hole, Mass., July 7, 1925, E. D. Ball. Types and paratypes in the E. D. Ball collection.

The genitalia of this species resemble those of *nitens*, but *borealis* is found in the northeastern part of the country and differs in being reddish-brown in color.

27. *Eutettix luridus* (Van Duzee)

Thamnotettix luridus, Van Duzee, Can. Ent. xxii, p. 250, 1890.

Resembles *subaeneus*, but shorter, with a shorter vertex and without two pairs of apical processes on the aedeagus. Length: Male, 5½ mm.; female, 6 mm.

Vertex slightly more than twice as wide as length at middle, almost parallel-margined, transverse furrow shallow; tegmen varying from translucent on the clavus to semihyaline on the corium.

Color: Frons fulvous with typical markings lighter, vertex and scutellum ivory-yellow with typical markings fulvous to deep reddish-brown, pronotum fulvous to reddish-brown with typical markings usually distinct. Tegmen translucent with clavus and adjacent area of corium deep fulvous to bright reddish-brown except for large white spot near apex; corium fulvous semihyaline with veins darker, apical cells sometimes slightly clouded.

Male genitalia: Pygofer long, about two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork shorter than ventral, gradually narrowing to sharp apex, ventral fork slightly broader than dorsal, almost parallel-margined to a sharp apex. Aedeagus in lateral view slightly over four times as long as greatest width, largest near middle, narrowing to a rounded apex on apical third; in ventral view bifid on outer third.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior margin almost straight, lateral margins slightly convex, posterior margin slightly convex except for large unnotched median lobe.

Types: Lectotype male, Ames, Iowa, May 19, 1881, allotype female Agricultural College, Michigan, October 24, 1888 in the Iowa State collection.

Material studied: Material is on hand from many points in the eastern half of the United States. The species is replaced west of Kansas by *discolor*.

28. *Eutettix discolor* n. sp.

Resembles *luridus*, but with transverse furrow more distinct, duller colored and with the dorsal fork of the pygofer hook curved abruptly near base. Length: Male, 5½ mm.; female, 6 mm.

Vertex two to two and one-half times as wide as length at middle, almost parallel-margined in female, slightly pointed in male, transverse furrow distinct; tegmen semihyaline with clouded spots in clavus, discal cell and apical cells.

Color: Frons fulvous with typical markings darker, vertex and scutellum ivory-white with markings fulvous and distinct, pronotum darker with typical markings usually evident; tegmen light semihyaline fulvous, darker along margin of clavus, except for white spot near apex of clavus, brown spot in discal and middle anteapical cells, apical cells sometimes slightly infuscated.

Male genitalia: Pygofer long, about two-thirds as wide at constriction as length from there to pointed apex; pygofer hook bifid, dorsal fork shortest, curved sharply near base, almost parallel-margined to sharp apex, ventral fork widest on outer half, apex pointed. Aedeagus in lateral view about seven times as long as greatest width, almost parallel-margined to outer third, narrowed to a rounded apex, a pair of short spines on dorsal margin at apical fourth.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior and lateral margins almost straight, posterior margin slightly excavated on each side of a slightly notched median lobe.

Types: Holotype male, allotype female, and 17 pairs of paratypes, Ruidosa, N. Mex., Oct. 10, 1940, John Medler. Additional paratypes as follows: 5 male, 2 female, Coffeyville, Kansas, Oct. 15, 1939, L. W. Hepner; 2 pairs, Douglas county, Kansas, Oct. 15, 1936, R. H. Beamer; 1 male, Cherokee County, Kansas, July 19,

1941, R. H. Beamer; 1 male, Anderson County, Kansas, Oct. 24, 1929, P. W. Oman; 1 male, Galena, Kansas, Oct., 1912; 1 male, 3 female, Riley County, Kansas, Oct., Marlatt; 1 male, 2 female, Chisos Mts., Tex., Sept. 19, 1938, D. J. & J. N. Knull; 6 male, 5 female, Douglas County, Kansas, Oct. 8, 1938; 1 pair, Ruidosa, N. Mex., June 26, 1940, R. H. Beamer. Types in the Kansas University collection; paratypes in this collection and the National Museum.

This species replaces *luridus* in the western part of the country, but differing in color and in the genital characters.

29. *Eutettix southwicki* Van Duzee

Eutettix southwicki, Van Duzee, Bull. Buff. Soc. Nat. Sci., v, 209, 1894.

Resembles *marmoratus* but with apical processes of aedeagus much longer; pygofer hook smaller. Length: Male, 5 mm.; female, 6 mm.

Vertex almost two and one-half times as wide as length at middle, almost parallel-margined, transverse furrow shallow, especially in the male; tegmen semihyaline fulvous, darkest in the male, with apical cells slightly infuscated.

Color: Face fulvous with markings, if present, darker; vertex, pronotum and scutellum fulvous to dark gray, darkest in the female, with markings distinct. Tegmen of male semihyaline fulvous throughout; veins of female darkening posteriorly with a few fuscous spots in clavus and adjacent area of corium with apical cells infuscated.

Male genitalia: Pygofer oval, about two-thirds as wide at constriction as length from there to truncate apex; pygofer hook single, almost parallel-margined on outer three-fourths, extending almost to apex of pygofer. Aedeagus in lateral view about four times as wide as greatest width, almost parallel-margined throughout, a pair of broad apical processes about twice as long as greatest width, over one-half as long as shaft of aedeagus.

Female genitalia: Last ventral segment about twice as wide as length at middle, slightly convex on lateral margins. Posterior margins slightly excavated on each side of a distinctly notched median lobe.

Types: Lectotype male, New York City, Aug. 12, 1891, E. B. Southwick in the Iowa State College collection, Ames, Iowa; allotype female, New Haven, Conn., Aug. 23, 1934, C. O. Dunbar, here designated, in the Kansas University collection.

Ball (Proc. Dav. Acad. Sci., xii, 36, 1907) stated that *E. brunneus* is a synonym of this species, but examination of the types showed that these two are distinctly different. Series of this species are rare and the females are much like *marmoratus*.

30. *Eutettix marmoratus* Van Duzee

Eutettix marmoratus, Van Duzee, Trans. Am. Ent. Soc., xix, 302, 1892.

Eutettix brunneus, Osborn, in 20th Rep. St. Ent. N. Y., 530.

Resembles *tristis*, but with markings on pronotum and frons absent, with aedeagus not bifid and with apical processes on aedeagus. Length: Male, 5 mm.; female, 6 mm.

Vertex almost three times as wide as length at middle, almost parallel-margined, transverse furrow distinct; tegmen semihyaline.

Color: Frons fulvous with typical markings slightly darker, vertex and scutellum ivory-yellow to fulvous with typical markings darker, scutellum fulvous to gray, lightest along the anterior margin; tegmen semihyaline fulvous with clouded areas across tegmen on anterior third and on apical cells. In some of the specimens, all color markings are absent and the specimens are fulvous throughout.

Male genitalia: Pygofer ovate, about three-fourths as wide at constriction as length from there to apex; pygofer hook extending almost to apex of pygofer, broadest on outer third. Aedeagus in lateral view about five times as long as greatest width, almost parallel-margined, a pair of slender apical processes about one-third length of shaft.

Female genitalia: Last ventral segment about twice as wide as length at middle, anterior and lateral margins almost straight, posterior margin slightly excavated on both sides of the unnotched median lobe.

Types: Holotype female, Balsam, N. C., July 23, 1890. W. J. Palmer in the Iowa State collection. *E. brunneus* types in the Ohio State collection.

This species is either quite variable or else there are several closely related subspecies. Collected material is rather scanty in the group with series small. The aedeagus may be much longer and more slender than typical and the pygofer hook may vary from slender to twice as wide as that of the type.

Plate XXII

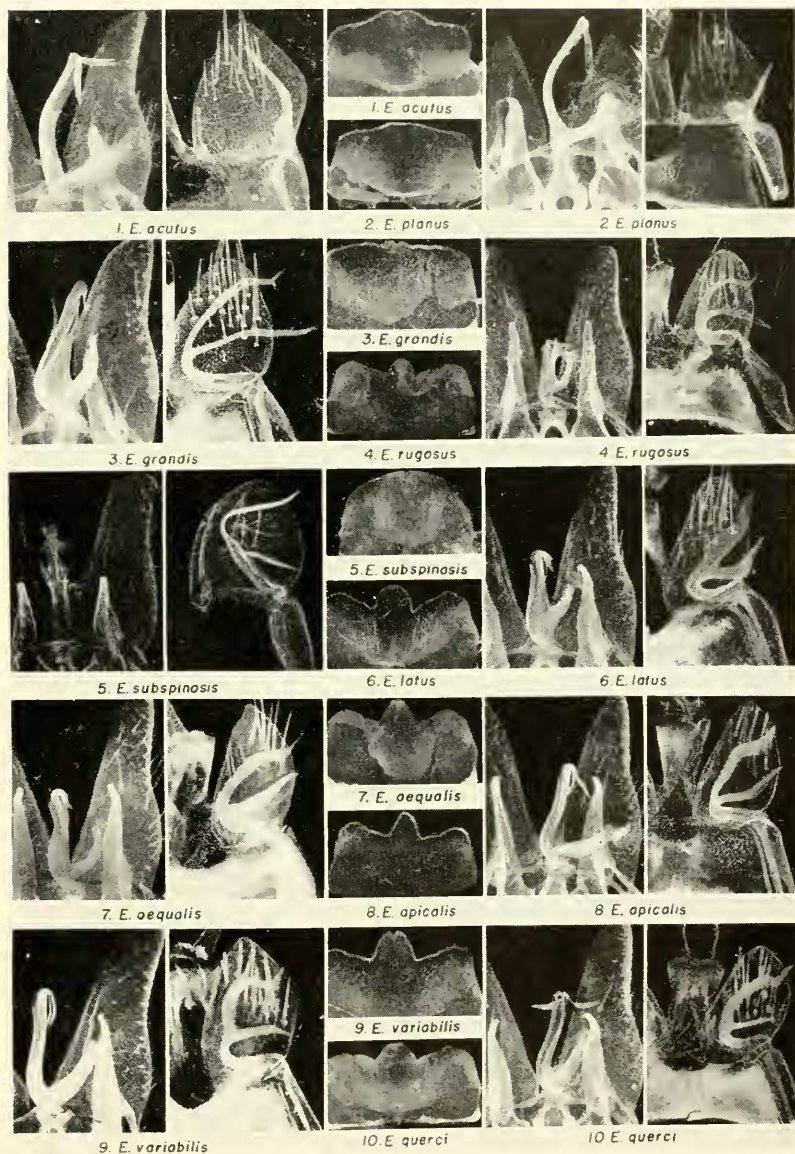
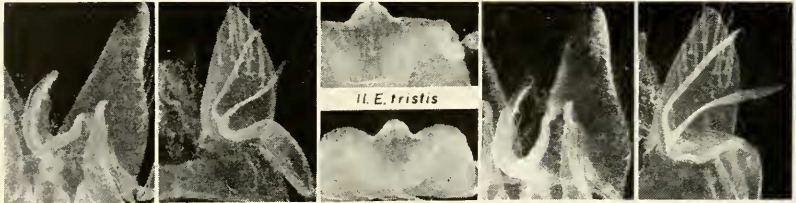


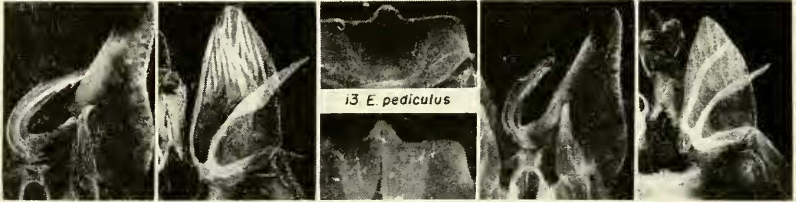
Plate XXIII



11. *E. tristis*

12. *E. prinoides*

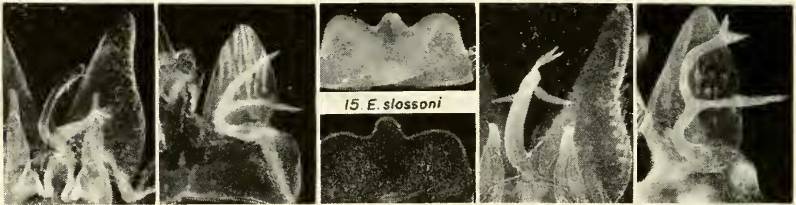
12. *E. prinoides*



13. *E. pediculus*

14. *E. pictus*

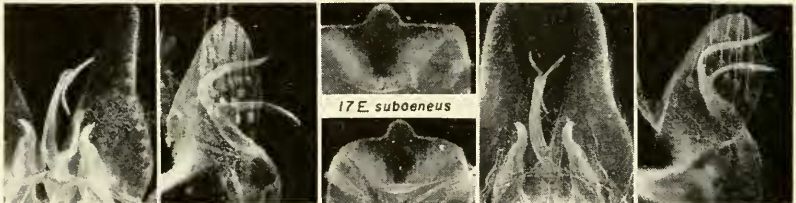
14. *E. pictus*



15. *E. slossoni*

16. *E. rubianus*

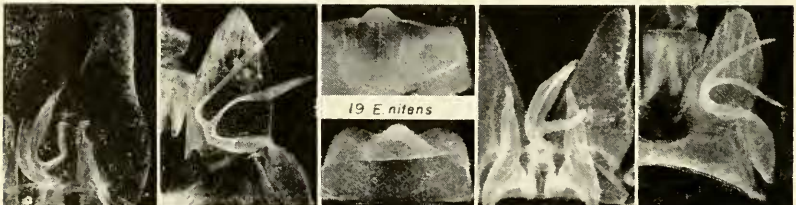
16. *E. rubianus*



17. *E. subaeneus*

18. *E. glennanus*

18. *E. glennanus*



19. *E. nitens*

20. *E. flavus*

20. *E. flavus*

Plate XXIV

